

What is claimed is:

- 1     1.     An apparatus, comprising:  
2             a voltage source to provide a substantially temperature stable output voltage;  
3             a first semiconductor device biased by the substantially temperature stable  
4     output voltage to provide a first output current; and  
5             a second semiconductor device biased by the substantially temperature  
6     stable output voltage to provide a second output current, the second semiconductor  
7     device to couple to the first semiconductor device to provide a reference current  
8     approximately equal to a difference between the first and the second output currents.
  
- 1     2.     The apparatus of claim 1, wherein the first and the second semiconductor  
2     devices are biased by the substantially temperature stable output voltage to operate  
3     in a saturation mode.
  
- 1     3.     The apparatus of claim 1, wherein the first and the second semiconductor  
2     devices are fabricated on a single die.
  
- 1     4.     The apparatus of claim 1, further including:  
2             a differencing circuit to couple to the first and the second semiconductor  
3     devices.
  
- 1     5.     The apparatus of claim 1, further including:  
2             a pair of current mirrors to couple to the first and the second semiconductor  
3     devices.
  
- 1     6.     The apparatus of claim 5, wherein the first and the second semiconductor  
2     devices and the pair of current mirrors are fabricated on a single die.

1 7. The apparatus of claim 1, wherein a reference magnitude of the reference  
2 current is approximately equal to a difference between the second output current and  
3 a product of the first output current and a scaling constant.

1 8. The apparatus of claim 7, further comprising:  
2 a differencing circuit including a first current mirror selected to determine  
3 the scaling constant.

1 9. The integrated circuit of claim 9, wherein the voltage source comprises a  
2 band-gap voltage source.

1 10. An integrated circuit, comprising:  
2 a voltage source to provide a substantially temperature stable output voltage;  
3 a first semiconductor device biased by the substantially temperature stable  
4 output voltage to provide a first output current; and  
5 a second semiconductor device biased by the substantially temperature  
6 stable output voltage to provide a second output current, the second semiconductor  
7 device to couple to the first semiconductor device to provide a reference current  
8 approximately equal to a difference between the first and the second output currents;  
9 and  
10 an output node in electrical communication with the first and second  
11 semiconductor devices to carry the reference current.

1 11. The integrated circuit of claim 10, wherein the first and the second  
2 semiconductor devices are biased by the substantially temperature stable output  
3 voltage to operate in a saturation mode.

1 12. The integrated circuit of claim 10, further including:  
2 a differencing circuit to couple to the first and the second semiconductor  
3 devices.

- 1 13. The integrated circuit of claim 12, wherein the reference current has a  
2 reference magnitude approximately equal to the difference between the second  
3 output current and a product of the first output current and a scaling constant  
4 determined by a current mirror included in the differencing circuit.
- 1 14. The integrated circuit of claim 10, wherein each one of the first and the  
2 second semiconductor devices comprise a field effect transistor.
- 1 15. The integrated circuit of claim 14, further including:  
2 a pair of current mirrors to couple to the first and the second semiconductor  
3 devices, wherein each one of the pair of current mirrors includes a pair of field  
4 effect transistors, and wherein the first and the second semiconductor devices and  
5 the pair of current mirrors are fabricated on a single die.
- 1 16. The integrated circuit of claim 10, wherein the voltage source comprises a  
2 band-gap voltage source.
- 1 17. A system, comprising:  
2 a cellular telephone including a voltage source to provide a substantially  
3 temperature stable output voltage, a first semiconductor device biased by the  
4 substantially temperature stable output voltage to provide a first output current, and  
5 a second semiconductor device biased by the substantially temperature stable output  
6 voltage to provide a second output current, the second semiconductor device to  
7 couple to the first semiconductor device to provide a reference current  
8 approximately equal to a difference between the first and the second output currents.
- 1 18. The system of claim 17, further comprising a differencing circuit to couple  
2 to the first and the second semiconductor devices.
- 1 19. The system of claim 18, wherein the differencing circuit includes a first  
2 current mirror selected to determine a scaling constant.

- 1    20.    The system of claim 19, wherein the reference current has a reference
- 2    magnitude approximately equal to the difference between the second output current
- 3    and a product of the first output current and the scaling constant.